Research Article

Evaluation of blood donor deferral causes: a tertiary-care center-based study

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Abstract

Background: Donor selection is necessary in addition to the screenings of blood bags for infectious diseases. Deferrals lead to loss of precious blood/components available for transfusion. For preventing this, we should be having knowledge of causes of deferral and their frequency.

Objectives: To evaluate blood donor deferral causes and possibility of donor retrieval.

Materials and Methods: Causes of donor deferral were evaluated retrospectively from January 2013 to July 2014 in the blood bank of C.U. Shah Medical College, Surendranagar, Gujarat, India. Totally 14,347 donors were screened, and of them, 660 donors were considered to be deferred.

Results: Temporary deferral was more common than permanent deferral. The most common cause in permanent deferral was HBsAg positivity (23.64%). Causes among temporary deferral were anemia (Hb < 12.5%) (24.11%), followed by jaundice, weight < 45 kg, age older than 18 years, patients on antibiotic, previous donation in last 3 months, typhoid in last 1 year, dog bite, and so on.

Conclusion: Analysis of deferral patterns may help medical personnel and doctors to be more focused in donor screening, especially of those who are having higher frequency. Temporarily deferred donors require proper follow-up and management so as not to lead to a diminished supply of future donors. It is important to determine the rate and causes of blood donor deferral for the safety of blood/component transfusion and to guide the recruitment efforts to prevent loss of precious blood/components at the local, national, and international levels.

KEY WORDS: Blood donor, blood donor deferral causes, donor retrieval

Introduction

In current medical and surgical practice, a blood transfusion can be a vital, life-saving procedure. But it requires an adequate supply of safe blood from a healthy donor. For this, donor selection is necessary in addition to the screenings of blood bags for infectious diseases. However, deferrals lead to loss of precious blood/components available for transfusion. For preventing this, we should be having knowledge of causes of deferral and their frequency. Statistics of the National AIDS Control Organization (NACO) show that the annual rate of blood donation in India is about 7.4 million units, against the requirement of 10 million units.[1] According to the figures of World Health Organization (WHO), over 81 million units of blood are collected annually worldwide, but only 39% are collected in developing countries, which have 82% of the world's population.[2] A blood bank plays an important role in ensuring the supply of safe blood as and when required. Although it is important to ensure that there is an adequate supply of blood, it is also essential that the blood collection process does not harm either the donor or the recipient. This is achieved by having donor deferral criteria[3] and stringent screening of collected blood for possible transfusion transmissible infections (TTIs).[4] Deferrals are divided into permanent and temporary. Few studies conducted in India in the past have provided different common reasons for deferral of whole blood donors, highlighting differing demographic profile in different parts of the country.[5,6] The aim of our study was to know the profile of the blood donors and causes of the permanent and temporary deferral and their frequency. This prospective study was conducted in the blood bank of C.U. Shah Medical College, Surendranagar, Gujarat, India, from January 2013 to July 2014.

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Materials and Methods

This prospective study included all the donors reporting for blood donation in the blood bank of C.U. Shah Medical College, Surendranagar, Gujarat, India, from January 1, 2013, to July 31, 2014. The donors were evaluated on the basis of clinical history, physical examination, Hb estimation, blood pressure, and temperature. The NACO guidelines were used for deferral of blood donors. Data were collected from the records maintained by the blood bank. Hemoglobin was measured by $CuSO_4$ method. Blood samples of these donors were screened for hepatitis B surface antigen (HBsAg) by ERBA HBsAg ELISA 3.0 Test kit (NACO supplies, Third National HIV/AIDS Control Project; Span Diagnostics Limited, India) and anti-HCV by SD HCV ELISA 3.0, the third-generation anti-HCV ELISA test (NACO supplies, Third National HIV/AIDS Control Project; SD Bio Standard Diagnostics Private Limited, Gurgaon, Haryana, India), anti-HIV by SD HIV1/2 ELISA 3.0, the third-generation anti-HIV1/2 ELISA test (NACO supplies, Third National HIV/AIDS Control Project; SD Bio Standard Diagnostics Private Limited), malaria by SD Malaria Ag Pf/Pan (SD Bio Standard Diagnostics Private Limited), and syphilis by ASPEN, one-step ultrarapid card test, a solid-phase immunochromatographic assay for the qualitative detection of antibodies of isotypes (IgG and IgM) against *Treponema pallidum* antigen.

Results

Of 14,347 people who had donated blood, 14,062 were men (98%) and 285 were women (2%) [Table 1]; 660 donors (4.6%) had deferred, of which 423 (64.10%) were temporary and 237 (35.90%) were permanent [Table 2]. Overall, men (480; 3.35%) had deferred more than the women (180; 1.25%). However, women (180; 63.15%) were found to have higher deferral rate among the women donors than men (480; 3.41%) [Table 3]. Analysis of the deferrals showed that the temporary deferral was more common than permanent deferral. The most common cause in permanent deferral was HBsAg positivity, followed by age older than 60 years [Table 4]. The most common cause among temporary deferral was anemia (Hb < 12.5%), followed by weight < 45 kg [Table 5].

Table 1: Demographic profile of the donors

	Registrations	Deferrals	Deferrals of total registration (%)
Men	14,062	480	3.35
Women	285	180	1.25
Total	14,347	660	4.60

Table 2: Frequency of permanent and temporary deferrals

	Deferrals	Total deferrals (%)	Deferrals of total registration (%)
Temporary	423	64.10	2.95
Permanent	237	35.90	1.65
Total deferrals	660	100	4.60

Table 3: Frequency of deferrals among male and female donors

	Donations	Deferrals	Deferrals among male/female donors (%)
Male	14,062	480	3.41
Female	285	180	63.15

Table 4: Causes of permanent deferrals with their relative proportions

Causes	*N*	Permanent deferrals (%)	Total deferrals (%)
HBV positive	156	65.82	23.64
Age > 60 years	30	12.66	4.55
HCV positive	16	6.75	2.42
Chronic obstructive lung disease	11	4.64	1.67
HIV-1,2 positive	9	3.80	1.36
Heart disease	7	2.95	1.06
Asthma	4	1.69	0.60
Epilepsy	3	1.27	0.45
Chemotherapy	1	0.42	0.15
Total	237	100	35.90

Discussion

Donor selection has vital importance in blood banking and transfusion medicine. The preamble of our study was to device a protocol that could prevent the loss of whole blood/component and be safe for the donors and recipients. Most of the donors were men (98%); women accounted for only (2%) of the donors. This study showed that women donors (63.15%) had deferred more frequently than men donors (3.41%), which might be due to wide prevalence of anemia in women. Donor deferral (4.60%) in this study was very much similar to various American, European, and Asian studies. Zou et al.[6] reported a deferral rate of 12.8% in their 6-year study of American Red Cross blood service, and Custer et al.[7] showed a deferral rate of 13.6%. In a European study conducted by Lawson-Ayayi and Salmi,[8] 10.8% of donors had deferred. Arslan[9] reported a donor deferral rate of 14.6% in Turkish donors. Lim et al.[10] reported a deferral rate of 14.4% in Singapore (Asia) and Bahadur et al.[4] reported 9% in Delhi, India. Rabeya et al.[11] found a very low deferral rate in their study (5.6%), which could be because of different donor selection criteria. The most common cause among temporary deferral was anemia (24.11%) when compared with the study by Halperin et al.,[12] which also showed low hemoglobin as the most common cause in 46% of the temporary deferral. In addition, the study by Arslan[9] in Turkish donors showed low hemoglobin as the most common cause of deferral in 20.7% of overall deferral. The findings of our study were very much similar to these

Table 5: Causes of temporary deferrals with their relative proportions

Causes	*N*	Temporary deferrals (%)	Total deferrals (%)
Anemia, Hb < 12.5%	102	24.11	15.45
Weight < 45 kg	70	16.55	10.66
On antibiotics for last 3 days	69	16.31	10.45
Jaundice in last 1 year	38	8.98	5.75
Upper respiratory tract infection	24	5.67	3.63
Age < 18 years	20	4.73	3.03
Previous donation in last 3 months	17	4.02	2.58
Syphilis for 1 month	16	3.78	2.42
Hypertension (>160/100 mm Hg)	13	3.07	1.96
Typhoid in last 1 year	12	2.83	1.81
Dental extraction/surgery in last 6 months	11	2.60	1.66
Diabetes and on insulin	10	2.36	1.52
Pregnant/lactating female	8	1.89	1.22
H/O tuberculosis with no ATT intake/incomplete treatment	5	1.18	0.75
Dog or cat bite/rabies vaccination in last 1 year	4	0.95	0.61
Poor vein	3	0.74	0.45
Tattoo/ear piercing in last 1 year	1	0.23	0.15
Total	423	100	64.1

studies. Anemia can be cured if these donors are properly treated with follow-up. The other causes of temporary deferral included low body weight, upper respiratory infection, syphilis, jaundice, and others which are easily curable. A proper track for the follow-up of temporarily deferred donors regarding their management should be made in the blood bank so that these donors can be recruited back in the donors' pool. In our study, 35.9% of donors were deferred owing to permanent reasons. Our findings (35.9%) were much higher than those of Custer et al.,[7] who reported a permanent deferral rate of 10.6%, and Arslan,[9] who reported a rate of 10%. This high frequency was because of the inclusion of TTI in our study, especially hepatitis B virus (HBV) infection, which was not studied thoroughly in the above-mentioned publications. This study showed HBsAg positive as the most common cause of permanent deferral when compared with Bahadur et al.,[4] who showed hypertension as the most common cause. The method used for hepatitis B testing in this study, as mentioned in Materials and Methods section to detect HBsAg positivity, indicated that either the donor had a subclinical disease/acute or chronic viral infection/false positive cases. So, for the benefit of the patients, these donors were deferred permanently. This is a very important finding that should be of great concern as HBV infection is increasing more among the local population and knowledge of routes of transmission of TTI can decrease the seroprevalence of HBV infection. Furthermore, this infection can be controlled by vaccination, which should be encouraged. Public awareness programs relating to the routes of transmission for these infections should be encouraged.

Conclusion

This study showed that although donor deferral rates were very much similar in different populations, the reasons for deferral differ, reflecting difference in socioeconomic status and environment. However, some studies showed different deferral rate, which could be because of different donor selection criteria. Analysis of deferral patterns may help medical personnel and doctors to be more focused in donor screening, especially of those who are having higher frequency, for example, anemia and HBV infection. Temporarily deferred donors require proper follow-up and management so as not to lead to a diminished supply of future donors. HBV infection can be prevented by educating people regarding the importance of HBV vaccination and routes of transmission. Finally, the approach to improve safety of blood and blood products and to decrease the loss of precious blood/component must include four steps: (1) detail history based on NACO/WHO guidelines; (2) physical examination; (3) laboratory tests including ELISA for anti-HIV, anti-HCV, and HBsAg and tests for malaria and syphilis; and (4) public awareness programs. So, to conclude, it is important to determine the rate and causes of blood donor deferral for the safety of blood/component transfusion and to guide the recruitment efforts to prevent loss of precious blood/components at the local, national, and international levels.

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